

FIG. 1

DIFFERENTIAL SIGNAL OUTPUT CIRCUIT IN FIRST EMBODIMENT

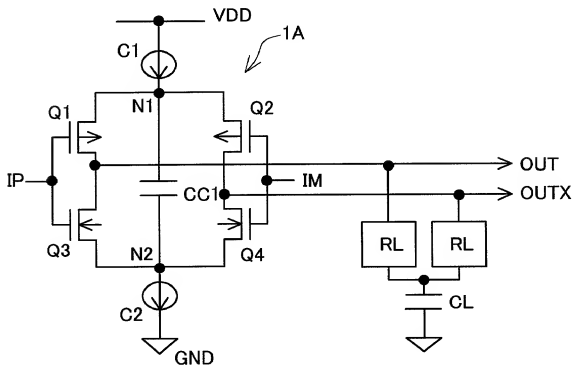


FIG. 2

EXAMPLE OF CURRENT SOURCE IN FIRST EMBODIMENT

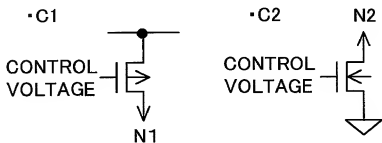


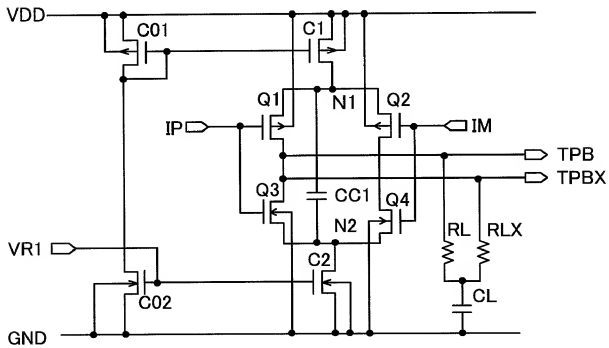
FIG. 3

SPECIFIC EXAMPLE OF CAPACITOR IN FIRST EMBODIMENT



FIG. 4

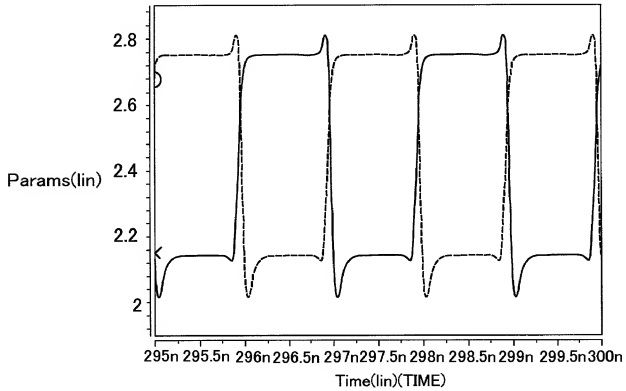
### SPECIFIC EXAMPLE IN FIRST EMBODIMENT



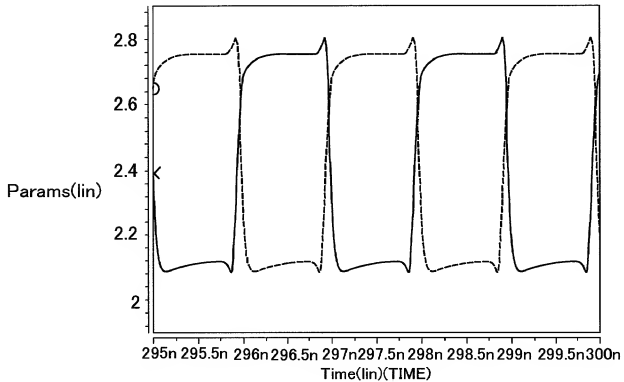
**FIG. 5A**

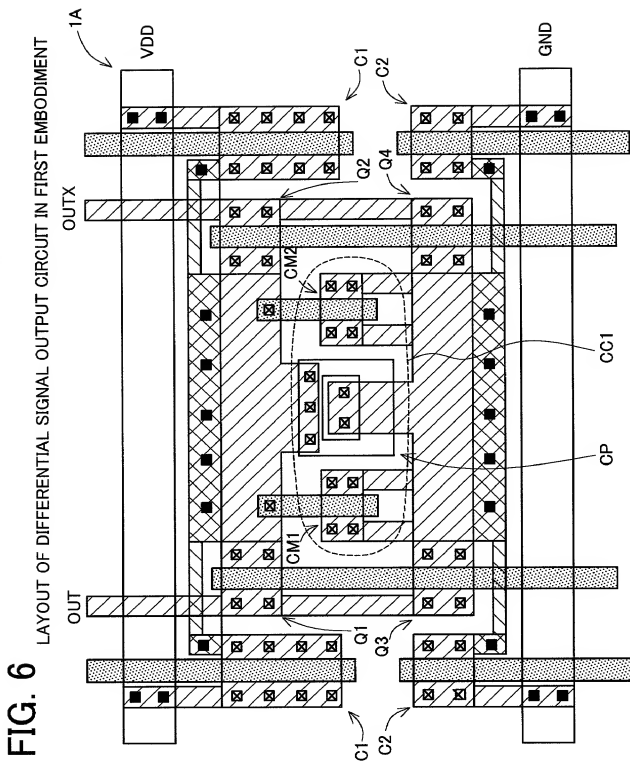
DIFFERENTIAL OUTPUT WAVEFORMS ACCORDING TO RESULT  
OF SIMULATION OF SPECIFIC EXAMPLE OF FIRST EMBODIMENT

PRIOR ART

**FIG. 5B**

FIRST EMBODIMENT

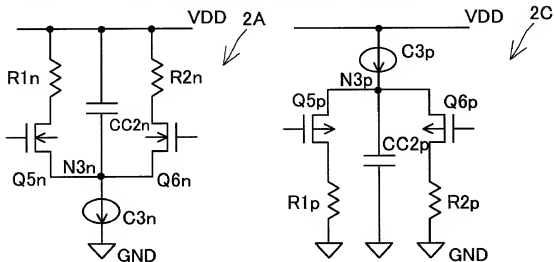




**FIG. 7A**

DIFFERENTIAL SIGNAL OUTPUT CIRCUIT IN SECOND EMBODIMENT

CIRCUIT STRUCTURED WITH PASSIVE LOADS

**FIG. 7B**

CIRCUIT STRUCTURED WITH ACTIVE LOADS

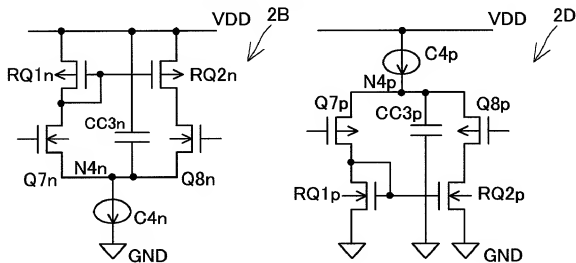


FIG. 8

BLOCK DIAGRAM ILLUSTRATING SIGNAL DETECTION APPARATUS IN THIRD EMBODIMENT

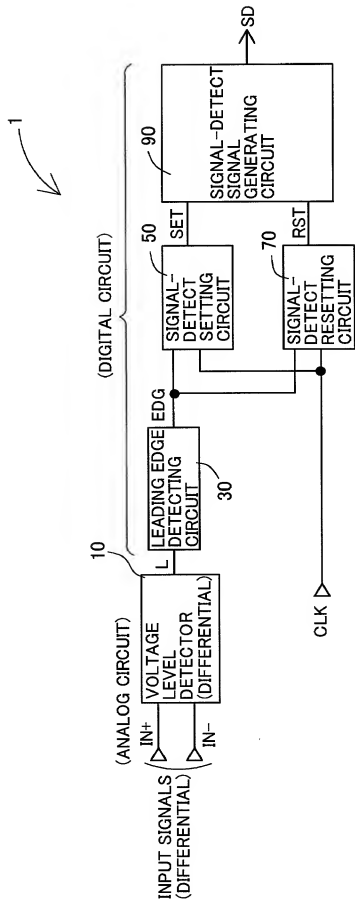
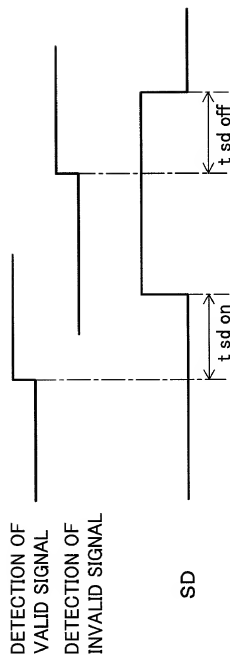


FIG. 9

TIMING PARAMETERS OF SIGNAL-DETECT SIGNALS ACCORDING TO P1394b STANDARD



SYMBOL	PARAMETER	UNIT	MIN.	MAX.
$t_{sd\_on}$	DELAY TIME FROM DETECTION OF A VALID SIGNAL UNTIL ASSERTION OF A SIGNAL-DETECT SIGNAL	$\mu\text{sec}$	—	100
$t_{sd\_off}$	DELAY TIME FROM DETECTION OF AN INVALID SIGNAL UNTIL NEGATION OF A SIGNAL-DETECT SIGNAL	$\mu\text{sec}$	—	$t_{sd\_on}$

**FIG. 10** CODE TABLE(1)  
8b10bCODES ACCORDING TO P1394b STANDARD

INPUT				ABCEI FGHJ OUTPUT				INPUT				ABCEI FGHJ OUTPUT			
NAME\A'B'C'D'E'F'G'H				RD<0	RD>0			NAME\A'B'C'D'E'F'G'H				RD<0	RD>0		
				DATA_TABLE[I][0]	DATA_TABLE[I][1]							DATA_TABLE[I][0]	DATA_TABLE[I][1]		
D0.0	00000000	1001110100	0110001011					D4.0	00100000	1101010100	0010101011				
D0.4	00000001	1001110010	0110001101					D4.4	00100001	1101010010	0010101101				
D0.2	00000010	1001110101	0110000101					D4.2	00100010	1101010101	0010101010				
D0.6	00000011	1001110110	0110000110					D4.6	00100011	1101010110	0010101010				
D0.1	00000100	1001111001	0110001001					D4.1	00100100	1101011001	0010101001				
D0.5	00000101	1001111010	0110001010					D4.5	00100101	1101011010	0010101010				
D0.3	00000110	1001110011	0110001100					D4.3	00100110	1101010111	0010101100				
D0.7	00000111	1001110001	0110001110					D4.7	00100111	1101010001	0010101110				
D16.0	00001000	0110110100	1001001011					D20.0	00101000	0010111011	0010101000				
D16.4	00001001	0110110101	1001001101					D20.4	00101001	0010111101	0010101001				
D16.2	00001010	0110110101	1001000101					D20.2	00101010	0010111010	0010101010				
D16.6	00001011	0110110110	1001000110					D20.6	00101011	0010111011	0010101010				
D16.1	00001100	0110111001	1001001001					D20.1	00101100	0010111001	0010111001				
D16.5	00001101	0110111010	1001001010					D20.5	00101101	0010111010	0010111010				
D16.3	00001110	0110110011	1001001100					D20.3	00101110	0010111100	0010111011				
D16.7	00001111	0110110001	1001001110					D20.7	00101111	0010111111	0010111011				
D8.0	00010000	1110010100	0001101011					D12.0	0011010000	0011011011	0011010100				
D8.4	00010001	1110010101	0001101101					D12.4	0011010001	0011011101	0011010101				
D8.2	00010010	1110010101	0001100101					D12.2	0011010010	0011010101	0011010101				
D8.6	00010011	1110010110	0001100110					D12.6	0011010011	0011010110	0011010110				
D8.1	00010100	1110011001	0001101001					D12.1	0011010100	0011011001	0011011001				
D8.5	00010101	1110011010	0001101010					D12.5	0011010101	0011011010	0011011010				
D8.3	00010110	1110010011	0001101100					D12.3	0011010110	0011011011	0011010011				
D8.7	00010111	1110010001	0001101110					D12.7	0011010111	0011011110	0011010001				
D24.0	00011000	1100110100	0011001011					D28.0	0011100000	0011101011	0011100100				
D24.4	00011001	1100110101	0011001101					D28.4	0011100001	0011101101	0011100101				
D24.2	00011010	1100110101	0011000101					D28.2	0011100100	0011100101	0011100101				
D24.6	00011011	1100110110	0011000110					D28.6	0011101011	0011100110	0011100110				
D24.1	00011100	1100111001	0011001001					D28.1	0011110000	0011101001	0011101001				
D24.5	00011101	1100111010	0011001010					D28.5	0011110001	0011101010	0011101010				
D24.3	00011110	1100111011	0011001101					D28.3	0011110110	0011101110	0011100011				
D24.7	00011111	1100110011	0011001110					D28.7	0011111111	0011101110	0011100001				
D0.0	01000000	1011010100	0100010111					D6.0	0110000000	0110011011	0110010100				
D2.4	01000001	1011010101	0100010101					D6.4	0110000001	0110011101	0110010010				
D2.2	01000010	1011010101	0100010010					D6.2	0110000010	0110010101	0110010101				
D2.6	01000011	1011010110	0100010110					D6.6	0110000011	0110010110	0110010110				
D2.1	01000100	1011010101	0100010001					D6.1	0110000100	0110011001	0110011001				
D2.5	01000101	1011010101	0100010100					D6.5	0110000101	0110011010	0110011010				
D2.3	01000110	1011010101	0100010110					D6.3	0110000110	0110011100	0110010011				
D2.7	01000111	1011010001	0100010110					D6.7	0110000111	0110011110	0110010001				
D18.0	01001000	0100111011	0100110100					D22.0	0110101000	0110101011	0110101000				
D18.4	01001001	0100111101	0100110010					D22.4	0110101001	0110101011	0110100010				
D18.2	01001010	0100111011	0100110101					D22.2	0110101010	0110101001	0110101010				
D18.6	01001011	0100111010	0100110110					D22.6	0110101011	0110100101	0110101010				
D18.1	01001100	0100111001	0100111001					D22.1	0110101100	0110101001	0110101001				
D18.5	01001101	0100111010	0100111010					D22.5	0110110101	0110101010	0110101011				
D18.3	01001110	0100111001	0100111001					D22.3	0110110110	0110101100	0110100011				
D18.7	01001111	0100110011	0100110001					D22.7	0110110111	0110101010	0110100001				
D10.0	01010000	0101010111	0101010100					D14.0	0111000000	0111001011	0111000100				
D10.4	01010001	0101010101	0101010101					D14.4	0111000001	0111001010	0111000010				
D10.2	01010010	0101010101	0101010110					D14.2	0111000010	0111000101	0111000101				
D10.6	01010011	0101010110	0101010110					D14.6	0111000011	0111001010	0111000110				
D10.1	01010100	0101010101	0101011001					D14.1	0111010000	0111001001	0111000101				
D10.5	01010101	0101010101	0101011010					D14.5	0111010001	0111001010	0111000101				
D10.3	01010110	0101010101	0101010011					D14.3	0111010100	0111001010	0111000011				
D10.7	01010111	0101010110	0101010011					D14.7	0111010111	0111001010	0111000100				
D26.0	01011000	0101101011	0101100100					D30.0	0111100000	0111100010	1000011011				
D26.4	01011001	0101101101	0101100010					D30.4	0111100001	0111100010	1000011101				
D26.2	01011010	0101100101	0101100101					D30.2	0111100100	0111100011	1000010101				
D26.6	01011011	0101100101	0101100110					D30.6	0111100101	0111100110	1000010110				
D26.1	01011100	0101101001	0101101001					D30.1	0111101000	0111101001	1000011001				
D26.5	01011101	0101101010	0101101010					D30.5	0111101001	0111101010	1000011010				
D26.3	01011110	0101101100	0101100011					D30.3	0111101100	0111100011	1000011100				
D26.7	01011111	0101101110	0101100001					D30.7	0111101111	0111100001	1000011110				
D1.0	10000000	0110101010	1000101011					D5.0	1010000000	1010011011	1010010100				
D1.4	10000001	0110101011	1000101010					D5.4	1010000001	1010011101	1010010101				
D1.2	10000010	0110101010	1000100101					D5.2	1010000010	1010011010	1010010110				
D1.6	10000011	0110101011	1000100110					D5.6	1010000011	1010010110	1010010110				

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**FIG. 11** CODE TABLE(2)  
8b10bCODES ACCORDING TO P1394b STANDARD

INPUT			ABCD EFGHJ OUTPUT			INPUT			ABCD EFGHJ OUTPUT		
NAME	A'B'C'D'E'F'G'H'	RD<0	RD<0	RD>0		NAME	A'B'C'D'E'F'G'H'	RD<0	RD>0		
		DATA_TABLE[0]	DATA_TABLE[0]	DATA_TABLE[1]				DATA_TABLE[0]	DATA_TABLE[0]	DATA_TABLE[1]	DATA_TABLE[1]
D1.1	10000100	0111011001	1000101001	D5.1	10100100	1010011001	1010011001	1010011001	1010011001		
D1.5	10000101	0111011010	1000101010	D5.5	10100101	1010011010	1010011010	1010011010	1010011010		
D1.3	10000110	0111010011	1000101100	D5.3	10100110	1010011100	1010011100	1010011100	1010011011		
D1.7	10000111	0111010001	1000101110	D5.7	10100111	1010011110	1010011110	1010011110	1010010001		
D17.0	10001000	1000111011	1000110100	D21.0	10101000	1010101011	1010101011	1010101011	1010100100		
D17.4	10001001	1000111101	1000110010	D21.4	10101001	1010101010	1010101010	1010101010	1010100101		
D17.2	10001010	1000111010	1000110101	D21.2	10101010	1010101011	1010101011	1010101011	1010100100		
D17.6	10001011	1000111010	1000110110	D21.6	10101011	1010101011	1010101011	1010101011	1010100101		
D17.1	10001100	1000111001	1000111001	D21.1	10101100	1010101100	1010101100	1010101100	1010101011		
D17.5	10001101	1000111010	1000111010	D21.5	10101101	1010101101	1010101101	1010101101	1010101010		
D17.3	10001110	1000111100	1000110011	D21.3	10101110	1010101110	1010101110	1010101110	1010100011		
D17.7	10001111	1000110111	1000110001	D21.7	10101111	1010101111	1010101111	1010101111	1010100001		
D9.0	10010000	1000110111	1001010111	D13.0	10110000	1011001011	1011001011	1011001011	1011000100		
D9.4	10010001	1001011011	1001010010	D13.4	10110001	1011001010	1011001010	1011001010	1011000010		
D9.2	10010010	1001011010	1001010101	D13.2	10110010	1011001010	1011001010	1011001010	1011000101		
D9.6	10010011	1001011010	1001010110	D13.6	10110011	1011001011	1011001011	1011001011	1011000101		
D9.1	10010100	1001011001	1001011001	D13.1	10110100	1011001010	1011001010	1011001010	1011001001		
D9.5	10010101	1001011010	1001011010	D13.5	10110101	1011001010	1011001010	1011001010	1011001010		
D9.3	10010110	1001011100	1001010011	D13.3	10110110	1011001010	1011001010	1011001010	1011000011		
D9.7	10010111	1001011110	1001010001	D13.7	10110111	1011001011	1011001011	1011001011	1011001000		
D25.0	10011000	1001101011	1001100100	D29.0	10111000	1011100010	1011100010	0100011011			
D25.4	10011001	1001101010	1001100010	D29.4	10111001	1011100010	1011100010	0100011101			
D25.2	10011010	1001100101	1001100101	D29.2	10111010	1011100101	1011100101	0100010101			
D25.6	10011011	1001100110	1001100110	D29.6	10111011	1011100110	1011100110	0100010110			
D25.1	10011100	1001101001	1001101001	D29.1	10111100	1011100101	1011100101	0100011001			
D25.5	10011101	1001101010	1001101010	D29.5	10111101	1011101010	1011101010	0100011010			
D25.3	10011110	1001101100	1001100011	D29.3	10111110	1011100011	1011100011	0100011100			
D25.7	10011111	1001101110	1001100001	D29.7	10111111	1011100001	1011100001	0100011110			
D3.0	11000000	1100001011	1100010100	D7.0	11100000	1110001011	1110001011	0001110100			
D3.4	11000001	1100001101	1100010010	D7.4	11100001	1110001010	1110001010	0001110010			
D3.2	11000010	1100001010	1100010101	D7.2	11100010	1110001010	1110001010	0001110101			
D3.6	11000011	1100001010	1100010110	D7.6	11100011	1110001010	1110001010	0001110110			
D3.1	11000100	1100001001	1100011001	D7.1	11100100	1110001001	1110001001	0001111001			
D3.5	11000101	1100001010	1100011010	D7.5	11100101	1110001010	1110001010	0001111010			
D3.3	11000110	1100001100	1100010011	D7.3	11100110	1110001010	1110001010	0001110011			
D3.7	11000111	1100001110	1100010001	D7.7	11100111	1110001010	1110001010	0001110001			
D19.0	11001000	1100101011	1100100100	D23.0	11101000	1110100100	1110100100	0001011011			
D19.4	11001001	1100101101	1100100010	D23.4	11101001	1110100010	1110100010	0001011101			
D19.2	11001010	1100100101	1100100101	D23.2	11101010	1110100101	1110100101	0001010101			
D19.6	11001011	1100100110	1100100110	D23.6	11101011	1110100110	1110100110	0001010110			
D19.1	11001100	1100101001	1100101001	D23.1	11101100	1110101001	1110101001	0001011001			
D19.5	11001101	1100101010	1100101010	D23.5	11101101	1110101010	1110101010	0001011010			
D19.3	11001110	1100101100	1100100011	D23.3	11101110	1110100011	1110100011	0001011100			
D19.7	11001111	1100101110	1100100001	D23.7	11101111	1110100001	1110100001	0001011110			
D11.0	11010000	1101000101	1101000100	D15.0	11110000	0101110100	1010001011				
D11.4	11010001	1101001011	1101000010	D15.4	11110001	0101110010	1010001101				
D11.2	11010010	1101000101	1101000101	D15.2	11110010	0101110101	1010000101				
D11.6	11010011	1101000110	1101000110	D15.6	11110011	0101110110	1010000110				
D11.1	11010100	1101001001	1101001001	D15.1	11110100	0101111001	1010001001				
D11.5	11010101	1101001010	1101001010	D15.5	11110101	0101111010	1010001010				
D11.3	11010110	1101001100	1101000011	D15.3	11110110	0101110011	1010001100				
D11.7	11010111	1101001110	1101001000	D15.7	11110111	0101110001	1010001110				
D27.0	11011000	1101100100	0010011011	D31.0	11111000	1010110100	0101001011				
D27.4	11011001	1101100010	0010011101	D31.4	11111001	1010110010	0101001101				
D27.2	11011010	1101100101	0010010101	D31.2	11111010	1010110101	0101000101				
D27.6	11011011	1101100110	0010010110	D31.6	11111011	1010110110	0101000110				
D27.1	11011100	1101101001	0010011001	D31.1	11111100	1010111001	0101000101				
D27.5	11011101	1101101010	0010011010	D31.5	11111101	1010111010	0101000110				
D27.3	11011110	1101100011	0010011100	D31.3	11111110	1010110011	0101001100				
D27.7	11011111	1101100001	0010011110	D31.7	11111111	1010110001	0101001110				

**FIG. 12**

SPECIFIC EXAMPLE VOLTAGE LEVEL DETECTOR IN THIRD EMBODIMENT

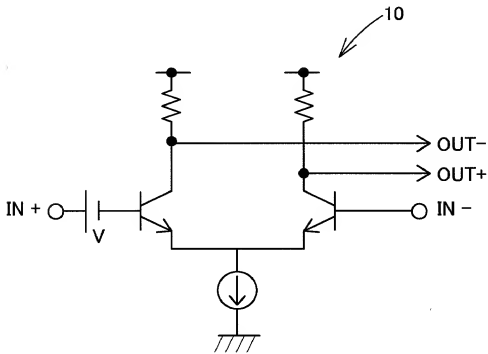


FIG. 13

SPECIFIC EXAMPLE OF SIGNAL-DETECT SETTING CIRCUIT IN THIRD EMBODIMENT

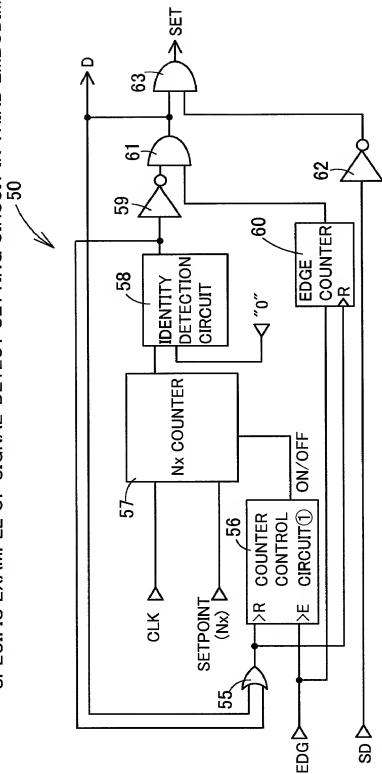
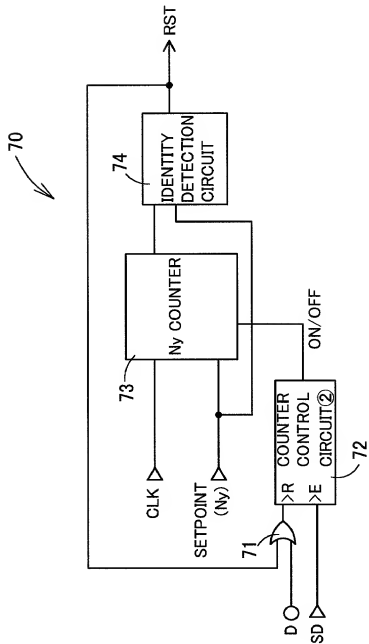


FIG. 14

SPECIFIC EXAMPLE OF SIGNAL-DETECT RESETTING CIRCUIT IN THIRD EMBODIMENT



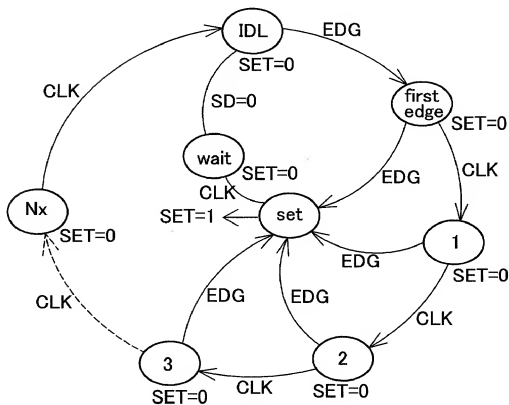
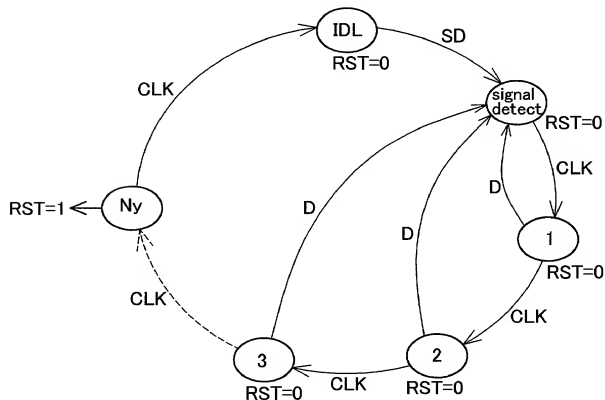
**FIG. 15** SIGNAL-DETECT SIGNAL SETTING SEQUENCE**FIG. 16** SIGNAL-DETECT SIGNAL RESETTNG SEQUENCE

FIG. 17

TIME CHART SHOWING SIGNAL-DETECT SIGNAL SETTING SEQUENCE

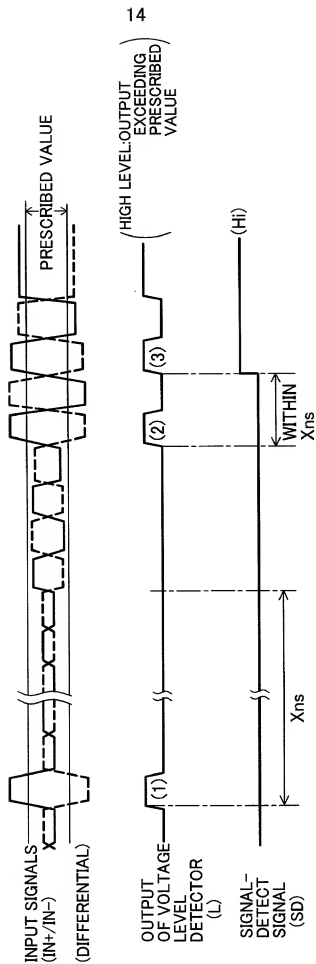


FIG. 18

TIME CHART SHOWING ACTIONS DURING SIGNAL-DETECT SIGNAL SETTING

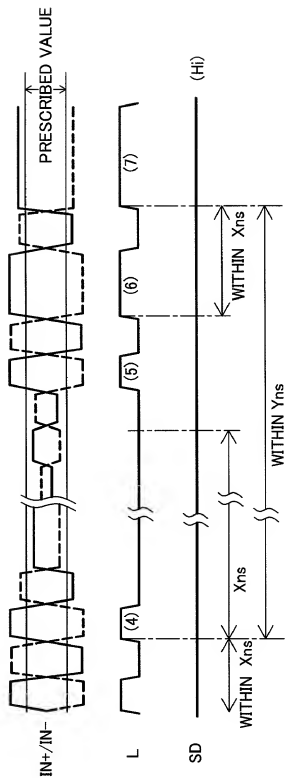


FIG. 19

TIME CHART SHOWING SIGNAL-DETECT SIGNAL RESETTING SEQUENCE

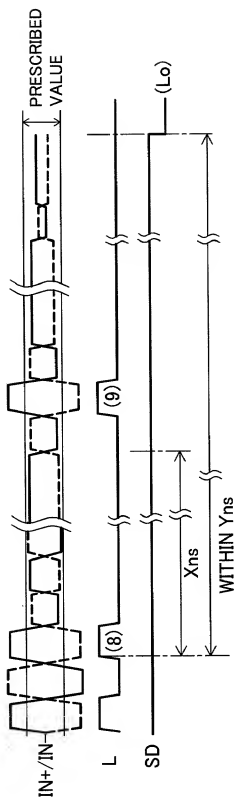
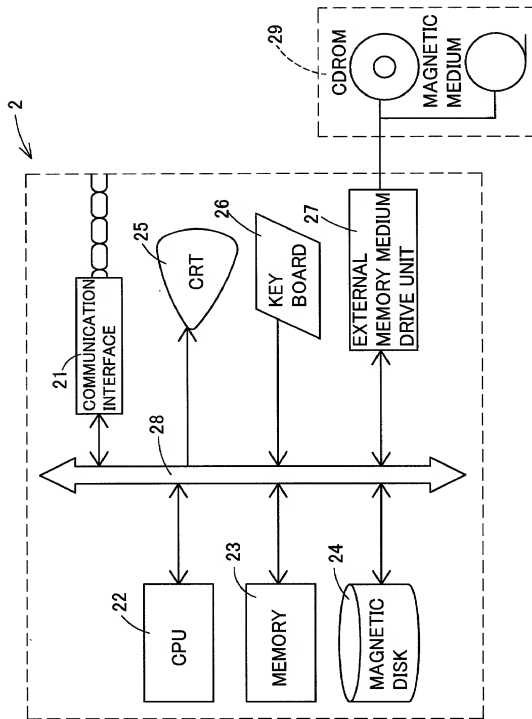


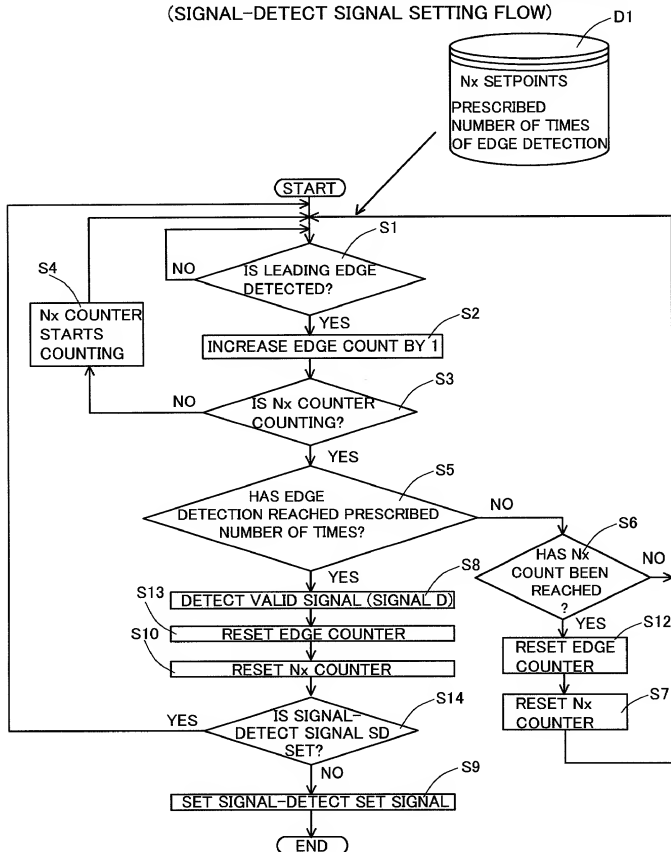


FIG. 20

CONFIGURATIONAL DIAGRAM OF SIGNAL DETECTION APPARATUS  
IN FOURTH EMBODIMENT



**FIG. 21** SIGNAL DETECTION METHOD EXECUTED BY SIGNAL DETECTION APPARATUS IN FOURTH EMBODIMENT (SIGNAL-DETECT SIGNAL SETTING FLOW)



**FIG. 22** SIGNAL DETECTION METHOD EXECUTED BY SIGNAL DETECTION APPARATUS IN FOURTH EMBODIMENT (SIGNAL-DETECT SIGNAL RESETTNG FLOW)

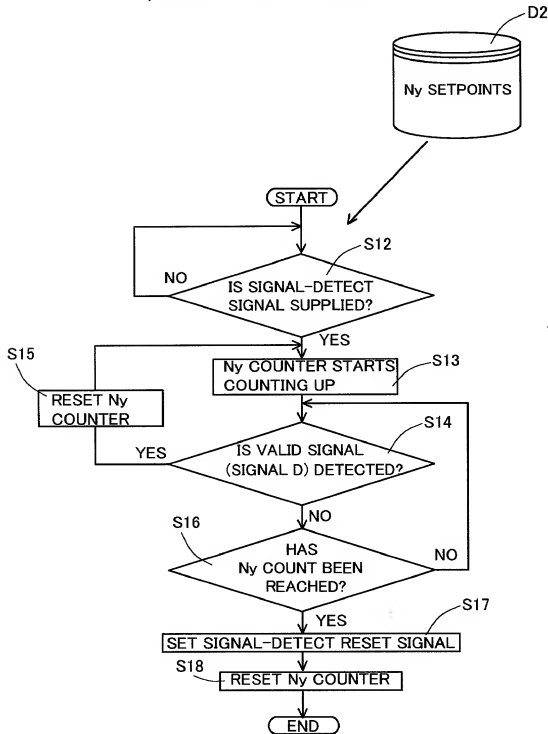


FIG. 23

### EXAMPLE OF DIFFERENTIAL SIGNAL TRANSMISSION SYSTEM

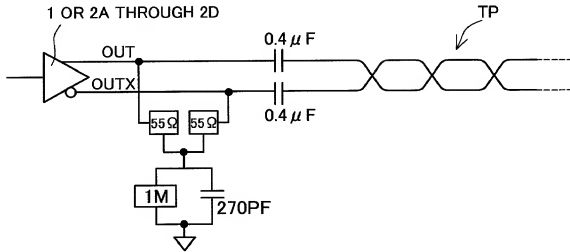
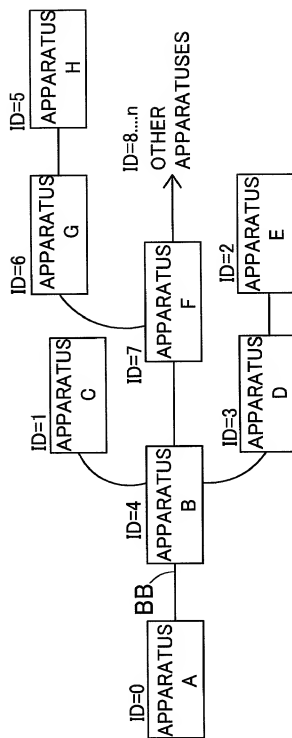


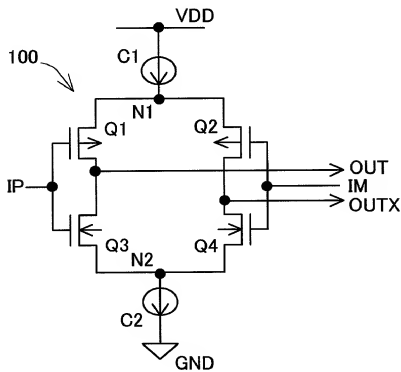
FIG. 24

EXAMPLE OF SIGNAL TRANSMISSION SYSTEM CONFIGURATION



# FIG. 25 PRIOR ART

DIFFERENTIAL SIGNAL OUTPUT CIRCUIT ACCORDING  
TO PRIOR ART

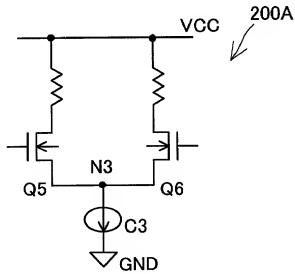


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# FIG. 26A PRIOR ART

ANOTHER DIFFERENTIAL SIGNAL OUTPUT CIRCUIT ACCORDING TO PRIOR ART

CIRCUIT WITH PASSIVE LOADS



# FIG. 26B

CIRCUIT WITH ACTIVE LOADS

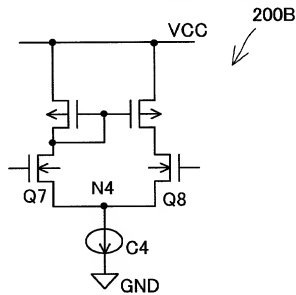


FIG. 27 PRIOR ART

SIGNAL DETECTION APPARATUS ACCORDING TO PRIOR ART

